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Necessity is the Mother of Invention: Changing Power Dynamics Between Teachers and Students in Wired Art Classrooms

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Change is occurring in our society, in our workplaces and in our classrooms. More than a decade ago, Gregory (1995) strongly advocated for art educators to consider interactive, digital technologies as significant to the future of Art Education. Roland (1990) concurs, writing:

The future holds the promise of rich interchanges between the worlds of art and technology. Art teachers can take advantage of this link by developing innovative approaches to the computer that help their students gain insights into its versatile role as an art medium. (p. 60)

Since 2000, the impact of technologies on our society has been critical, significant, and extensive (Delacruz, 2004). In what follows, the author of this research explores art educators' perceptions and approaches to working with technology, in light of the emerging technology as a significant and increasingly prevalent art education tool, as a means of student communication, and as a means of personal, artistic expression. Processes of teaching are discussed from the perspective of art teachers working in innovative, digital cutting-edge art classrooms.

Overview of Technology in Art Classrooms

Relationship to Research in Art Education Literature

Delacruz (2004) provides a comprehensive survey on new technology research in art education from 1984-2004 (see p. 6-7). She concludes that these studies are primarily “descriptive, prescriptive and promotional” (p. 6). Since Delacruz’s survey, there has been a notable increase in the level of interest in digital technology research in art education. Researchers have examined digital technologies in terms of university level training and in-service teaching for practicing educators (Browning, 2006; Cameron, 2000; Gouzouasis, 2001; Hutzel, 2007; Kundu & Bain, 2006). Others have documented graduate university training in new media (Delacruz, 2004; Hutzel, 2007). A few researchers have described secondary level teaching in digital technologies (Darts, 2006; Shin, 2005; Springgay, 2005). Descriptive ways of approaching new media range from introducing students to Internet Art (Coleman, 2004), offering advice concerning uses and assessments of digital portfolios (Dorn & Sabol, 2006), to teaching about visual light projections (Eisenhauer, 2006), fotonovelas (Emme & Kirova, 2005a) and photographic compositing (Emme & Kirova, 2005b). Recent ways of utilizing technology in classrooms include descriptions of online web instruction (Erickson, 2005), on-line courses (Keifer-Boyd, Amburgy, & Knight, 2007; Lai & Ball, 2004), depictions of virtual reality projects (Sakatani, 2005), and the teaching of music videos (Taylor, 2007).

Delacruz (2004) points out that although “digital technology’s impact in the 21st century is one of the most crucial, critical and far-reaching” (p. 7) issues in art education, there is a scarcity of research telling “us much about how practicing teachers view or learn to apply electronic media in their professional lives” (p. 7). In the recent literature, teachers’ lived experiences are seldom examined: their beliefs, observations, and attitudes towards technology are not often expressed (Black, 2002; Cuban, 1993, 2001). In Browning’s (2006) study of digital technologies she stresses the importance of attempting to come to a greater understanding of art educators’ perceptions and approaches to working with technology. What is

particularly lacking in the field is literature that focuses on the power-knowledge dynamic between teacher and students in virtual classrooms. In the following text, I will discuss technology programs within two separate Canadian schools and describe teachers' perspectives and "*lived experiences*" regarding technology usage, specifically pertaining to issues of authority and pedagogy.

Method

Case Study Description

Cross-case study research was conducted in two schools from 1997-2000. Data was collected over a two and a half year period using interviews, participant observations, field notes, and archival information collected from school publications, media articles, and Internet sources. The study lasted four years. In this article pseudonyms are used to designate schools, teachers, and students. Interviews were the primary means of obtaining information. Even though close to forty people were initially interviewed, the selection of teachers was narrowed to twelve (six from Glen Manor and six from Pleasant Dale).

Educators chosen for the study ranged from luddites¹ to tech-savvy teachers; they were chosen for their ability to reflect and articulate about their experiences as teachers. In addition to eight teachers from the Visual Arts, four teachers were selected from other areas to specifically include classes associated with English, Media, Film, and Computers. However, all twelve teachers were working with technologies in relation to visual art theory and practice². In summary, all teachers were selected on the basis that they were (1) integrating technology in their classrooms; (2) reflecting on a wide range of experience with technology; (3) articulately expressing their attitudes towards technology; and (4) infusing visual art theory and practices within their curricula.

Five of the six teachers at Pleasant Dale had a strong background and extensive work experience in the Visual Arts. Only two of the six teachers at Glen Manor had this background. This indicates the relative importance placed on Visual Arts in

Pleasant Dale. At this school, Visual Arts had a high profile, particularly in the WiredIMAGE program: a key program driving the Visual Arts curricula. In Glen Manor, the Visual Arts did not have a high status position: art was but one subject area among many in this school. Semi-structured interviews were used for the first interview session. If additional data clarification was needed, open-ended interviews were then used for this purpose.

The analysis was conducted from 2000-2002, in which techniques common for case study research were employed. All interviews were transcribed verbatim, which according to Merriam (1998) helps to match the reality of the case study with the research information gathered. Member checks were utilized for verifying transcripts. Data triangulation was used (Hitchcock & Hughes, 1995, p. 324), through gathering data using numerous types of techniques, as previously described. Donmoyer's (1990) process was applied using *assimilation*, *accommodation*, *integrated* and *differentiated cognitive structuring* in order to extract generalizations from the data. Consequently, this research will shed light on ways practicing art educators working in the field can exploit new media in the course of their professional activities.

Description of the Schools and Issues of Authority and Pedagogy

Glen Manor and Pleasant Dale were the schools selected for this study based on two criteria: firstly, they used state-of-the-art technology; secondly, technology was well integrated within the curriculum. External indicators of success validated this choice—both educational institutions have had extensive and positive media coverage owing to their innovative digital programs; many provincial Visual Art consultants recommended both schools; and the schools were also recommended by provincial and national Visual Art education organizations.

Glen Manor College

Glen Manor is a British model private school located in a small, wealthy town an hour drive from a major Canadian metropolis. The philosophical approach of this traditional pri-

vate school is one based on liberal, humanistic beliefs. The school's literature claims that students will be provided with a well-rounded education, a global perspective on issues, rigorous academics with a focus on the arts, extra-curricular activities and community service. Glen Manor is a preparatory college for university and has a teacher-focused and subject-driven curriculum structure. This school also has a Visual Arts program staffed by two teachers. These educators have included graphic arts, traditional arts, art history and theory into their program.

Glen Manor's laptop program was launched in September 1998. Its administrators claim it is the first Canadian school to implement a fully integrated laptop program with each pupil having access to his or her personal computer. All educators received personal PC laptops paid for by the school, and teachers and students use the same hardware and software. Teachers are trained extensively, and they participate in weekly, in-school digital workshops. Moreover, school administration financially supports teachers who need to take technology courses, and there is also a well-staffed IT Department. Hence, Glen Manor excels in providing adequate technological and material support.³ Given this context educators are expected to use computers daily in all classes.

The school's administration expects teachers to act as *teachers-in-authority*, through utilizing a teacher-centered approach. At Glen Manor, an autocratic style of teaching is prevalent in which competent educators impart extensive knowledge, experience, and information using lecture, and Socratic question-and-answer teaching strategies. Glen Manor's recruitment literature conveys the school's philosophy: teachers are the all-knowing authority ready and able at all times to impart wisdom, knowledge and the "right" answers to students.

Glen Manor educators utilize technology primarily in the form of PowerPoint and Internet text and image projections onto a whiteboard. Whiteboards are also used as chalkboards and students' computers replace traditional notebooks. The traditional *talk-and-chalk* teaching method (Connell, 1985) has been replaced by a "*talk-and-click*" approach. Pupils listen

quietly using their laptops to take notes and often use search engines to conduct research for assignments. Students work on the same material side-by-side with each other and in step with the teachers. Even though the school has cutting-edge technology, the approach to teaching and learning is still pervasively a traditional 19th century knowledge-transmission model.

Through my interviews I have learned that Glen Manor teachers are reluctant to relinquish their authority. For instance, Mr. Tyke enjoys demonstrating his technological abilities to his students: he lets it be known that he will not be outwitted. To demonstrate his control, Mr. Tyke often tracks ongoing student e-mails sent during his class and sends his reply to any pupils he has caught red-handed. In an interview he states:

‘Hi, it’s Mr. Tyke and I’m replying to the e-mail you sent to so and so who is in the middle of a class and I know that you are in the middle of someone else’s class too. I wonder whose? I wonder if I should tell them! Would you like to tell me what class you’re in? I’d appreciate it!’
‘Of course you get no response at all. Those things are important, as any teacher will tell you ... It’s just enough to let the kids know that not only are you interested, but you are good at it too. You’d be surprised how much they appreciate that and respect it. The last thing you want in the classroom with a bunch of technology, the kind of stuff that this is, is someone who doesn’t know anything about it at all. (Black, 2002, p.240)

Within the *teacher-as-authority* model, a difficulty arises when a skilled student becomes haughty and proud about knowing more than the so-called expert teacher. Ms. Ridley, one of the Visual Art teachers at Glen Manor, reflects on the situation concerning her teacher colleague, Mr. Tyke, and his student, Lyle:

Lyle ...was just so far above and advanced than anybody else that nobody could teach him anything. He became a little bit full of himself and a little bit arrogant. I mean towards the end it was very typically a senior student who was ready to move on. He’d outgrown this place and his

head was not here. It was [in] California. I think it was a little difficult maybe with Mr. Tyke because I think he felt that he'd outgrown Mr. Tyke and he knew more than Mr. Tyke did. Mr. Tyke might not say that he had a hard time but I know the kid was pretty cocky towards the end about it. (Black, 2002, p. 309)

This is merely one example of teachers at Glen Manor expressing discomfort—even great apprehension—at being placed in a position in which they were less knowledgeable than their students. However, I encountered two examples that may indicate subtle change in this regard. Firstly, though using software as a means of expression was never observed during art, students taught themselves creative use of visual art software during slotted extracurricular after-school workshops. The Visual Arts teachers themselves attended these workshops in order to learn the software. Secondly, on an informal basis, students would teach their educators about Visual Art software, which they found interesting. It is noteworthy that, outside of the formal classroom, and only in Visual Arts activities, students sometimes assumed the role of their teachers' instructors.

Pleasant Dale Collegiate

Pleasant Dale is a public school located in a middle, to upper middle class area of a densely populated, multicultural city of two and a half million people. Between 1996 and 1997, at the time Glen Manor was beginning to implement its laptop program, Pleasant Dale launched an extensive Windows NT technology pilot project. It was designated as a cutting-edge public school with a mandate to train students in technologies as well as in the more traditional subject areas. In addition to the regular program, a unique program called WiredIMAGE is housed in one section of the school. This program began in 1995 and has a focus in the Visual Arts and Technology. In a sense, WiredIMAGE operates as a school within a school.

WiredIMAGE teachers are hired using several distinctive criteria: a firm foundation in Visual Arts, experience working with technology, and a prior job in Art outside of teaching. The program is structured so that the Visual Arts is its foundation.

Technology, media, communication, and computer studies complement the core Visual Art curricula. Students work on traditional Visual Arts projects such as painting, drawing, and sculpture, as well as a range of technological projects, including website design, videography, animation, digital photography, desktop publishing, and new media production. Community projects are often amalgamated into the curriculum. Traditional as well as new media artists share knowledge as guest speakers, workshop artists, and “artists in the schools”. Educators throughout the world have visited WiredIMAGE to view this very innovative program firsthand.

In-service technology training, and financial support at Pleasant Dale are surprisingly inadequate. Training was offered during the first year that the technology was implemented and was almost non-existent thereafter. The IT department consists only of one full-time staff member. No extra monies are provided for teacher training. Consequently, educators often do not know how to use software extensively. In our interviews, some teachers, like Ms. Chiu, expressed the belief that educators should have a solid technological foundation in digital art, possess excellent technological skills, have ongoing technical support provided by their schools, and, through ongoing training, keep abreast of rapid technological changes. Rapid changes in technology from month to month, low school funding, and lack of teacher training and support has led to a reality that is quite different. Ms. Herbiere, another teacher at Pleasant Dale, provides the following analogy to describe her reality at her school:

I saw a movie as a kid about a guy who was being in prison for some reason and he grabbed a pocketbook out of a guard's pocket. He was incredibly disappointed when he got to his cell and found out it was a book about chess because he thought he was going to be in prison for life and he had this one book. It better be something good! So anyway, he soaked little breadcrumbs and he dyed some with coffee and he made these little breadcrumb chess players. He became quite brilliant but he could only play [with] himself. Then miraculously he gets out of jail and he's walking by a New York City chess

game where there are all these brilliant chess players and he starts suggesting some moves. People say, "This guy is amazing! He knows as much as the most amazing player in the world!" They asked him who he is and where he has been playing. He said, "Well, honestly, this is the first time I've ever held a chess piece." I guess sometimes that's how I feel. I've never really had the opportunity to hold the chess piece myself. (Black, 2002, p. 233)

Ms. Herbiere's observations seem to correspond to Delacruz's (2004) findings. Delacruz writes that teachers are often limited by time constraints, inadequate on-site support, insufficient feedback, and poor working conditions that fall short of fostering effective learning about technology usage within art classrooms (p. 10-15). Ms. Chiu also reflects on this situation:

...you are depending on the only other solution: that is to have students become self-directed learners and we simply work at being managers with little hands-on experience. Adequate but certainly not inspiring when instilling confidence in our students when it comes to a whole-some learning environment. (Black, 2002, p.252)

Most teachers in the regular program at Pleasant Dale position themselves as non-authorities. As a result of an insufficient IT department to help teachers with technical difficulties, inadequate in-service training, lack of funds to support the ongoing learning in post secondary institutions, it is no wonder a learner centered, project-driven focus is stressed. In short, Pleasant Dale has many teachers who adhere to student-centered classes and project-driven curricula: they do this out of necessity, not choice.

In the WiredIMAGE program all teachers veer toward learner-centered classrooms, and in fact, the director of the program advocates this stance for all teachers. Constructivist teaching is promoted, consistent with Prater's theories (2001). In WiredIMAGE's brochures, teachers are described as facilitators. Both co-operative learning and co-learning are firmly established as the effective pedagogical strategies utilized

within this program. These approaches are favored because it makes sense to do so given educators' limitations. If one is provided little support, little training, and few resources, teachers often rely on the pre-existing technological knowledge of their students. Consequently, it is practical to develop a learner-centered problem-solving teaching style. Interestingly, sometimes necessity creates positive change. The following axiom reveals much truth for WiredIMAGE: "necessity is the mother of invention."

At Pleasant Dale, even though students have input in, and hence, more control over their learning, teachers still hold positions of power in the class. Educators are responsible for creating and implementing curriculum, marking, and class management. Foucault's description of the discourse of doctors in his book *Archeology of Knowledge* (p. 50-51) can be applied here to describe the program: Doctors have hierarchical status, are perceived through institutional assessments to have competence and knowledge in the field of medicine, authority, and hence are given the legal right and societal backing to practice their profession. Similarly, in terms of the teachers' discourse, teachers have been certified and have the right to practice legally, are perceived to have pedagogical competence and knowledge, and are given the authority to practice as well as issue educational statements, including those related to students' evaluation. Like the now visible prison guard in the famous "Panopticon" that Foucault (1995) described, educators are expected to and are given the power to exert control within their own practices. However, in virtual classrooms, with short-lived technologies and the fast-pace of digital software and hardware turnover, the teachers' role has changed. An alternative power-knowledge dynamic is arising as a result of students' self-taught digital knowledge and savvy technological skills. Given societal expectations related to educators' professional responsibilities, how do educators handle the new situation they find themselves in when working within virtual art classrooms?

Pleasant Dale: Changing Power Dynamics Between Teachers and Students

Educators are partnering with students to utilize collaborative teaching-learning processes. Tapscott (2009), in the context of Web 2.0 applications, refers to this markedly new teacher-student relational power shift:

You are reminded of the old Bob Dylan line, 'There is something happening here but you don't know what it is.' There is something happening here. The Net Generation⁵ has come of age. Growing up digital has had a profound impact on the way this generation thinks, even changing the ways their brains are wired. ...These young people are remaking every institution of modern life... In education they are forcing a change in the model of pedagogy, from a teacher-focused approach based on instruction to a student-focused model based on collaboration. (p. 10-11)

At Pleasant Dale this shift is apparent. Students do not regard their teachers as experts, as holders of all knowledge, but rather as *facilitators*. The locus of power has shifted. The director of WiredIMAGE, Mr. Kreighoff, discusses his teaching method and the resulting changes in power relations:

Later on, when I brought in other technologies into the program, then I did have to bring students [in] as more *partners* in the set-up...not only for me, but for the rest of their peers. You can't help but in that modeling situation to be challenged by the students because you've now opened up floodgates and you've shared the keys with them. And you can't all of a sudden be the authoritarian or go back to a traditional mode of teaching of the "sage on the stage" because those students in practice have been partnering with you in a very real way. Once that's stopped they won't allow you—because it would be hypocrisy to do so—to go back into a traditional program. (Black, 2002, p. 173)

Mr. Kreighoff proceeds to describe his new position as that of a “guide”:

The teacher still has the expertise and the control of the environment. They don't have to be the last authority on every aspect of every piece of equipment. The analogy is the bicycle. It's good to come back to very simple analogies: it's your responsibility to know that bicycle, to know that child can benefit or get hurt from it. You essentially coach the child on how to take the first pedal or the first steps and how to stop. After that, if the kid is going to do wheelies or tricks then it's time they have to put in. That is something you can't replicate. But you should know what that bicycle is capable of. You should make sure it is in working order and it is safe. And, you should be able to show to the kid, either through demonstration or bringing in an expert or getting a video, how far [they can go] if they put in the time and the concentration. (Black, 2002, p. 238)

As the director of WiredIMAGE, Mr. Kreighoff expects all teachers to employ the same approaches he utilizes. This has a direct impact upon the teacher hiring processes and the program's development as a whole. It is an important finding that educators in the WiredIMAGE program have altered their teaching approach to effectively include greater student participation, teacher-student collaboration and partnerships in an environment promoting co-learning between learners and teachers. They have done this out of necessity.

Conclusion

Educators' perceptions of and approaches to working with technology were examined in specific reference to issues of authority and pedagogy. It was found that teachers' styles of teaching in digital art classrooms are dependent upon several determining factors.

Firstly, teaching styles are shaped by the school philosophy and the conditions therein. Secondly, instrumental in affecting educators' approaches to teaching are the mandates of special programs within their schools. Lastly, teaching styles

are contingent upon the resources available to schools--this is a crucial factor. Money provides training and support that greatly influences teaching styles. If technological training is strong, equipment and money for technology is not a problem and teachers often teach in a more traditional manner, as is evident in Glen Manor. As Marshall McLuhan theorized, new technology is often used in old ways (Sobelman, 2002). Teachers at Glen Manor utilized 21st century technology in a school mainly employing 19th century pedagogy. As in the case of Glen Manor, a teacher-centered approach can be easily maintained when educators acquire the knowledge and skills required to maintain a certain authority. The teachers' ongoing computer training was the means to achieve these results. This private school, can afford the costs involved.

Conversely, if training and support is insufficient, as is the case with Pleasant Dale Collegiate, teachers can choose to utilize a more student-centered constructivist approach, partly relying on pupils for answers and collaborative training. This is what developed at Pleasant Dale. Why not enable students in this manner? Why not enable students to assume some control, problem solve, use critical thinking skills, co-learn, collaborate, create partnerships, peer-teach, teach their teachers, and seek out assistance from within the extended community? Given their particular circumstances, teachers at Pleasant Dale find this approach effective. It works. With the recent advent of Web 2.0 technologies, more computers in the schools, greater involvement of youth as partners, collaborators, and "*prosumers*"⁴ (Tapscott, 2009), more research needs to be done in this area. Consequently, in this study, I have found that systemic determinants have a great impact on the pedagogical approaches adopted by teachers. Moreover, in light of increasing usage of technology, it is recommended that future research include an examination of factors other than systemic determinants, such as ways in which art educators are using digital technologies creatively in art classrooms.

In analyzing the systemic determinants, an interesting contradiction arises. Glen Manor College has strong financial backing, enabling teachers to deliver a strong, traditional humanistic program that is rigorous. This has helped establish its excel-

lent reputation. Educators at the school, though, utilize technologies in art education practices in traditional, unexciting, conventional ways, primarily employing a teacher-centered, autocratic approach. Students are passive learners. Pleasant Dale Collegiate, however, has inadequate financial support, causing instability and a host of problems. Given such a tough working environment, one would think that technology programs would not flourish at Pleasant Dale. However, through innovative and creative teaching/learning approaches, Pleasant Dale teachers working in the WiredIMAGE program have survived and thrived. By doing so they have created an exciting, successful and unique program. The recognition that Pleasant Dale receives through the media, the community, and the attention of international educators who visit its premises is an indication of its success.

Gregory (2009) provides advice to art educators concerning the integration of learning technologies in today's art classrooms. She writes:

Educators must make a profound shift in the ways they think about classroom practice to enact real education reforms. We must make a 180-degree shift from teacher-directed to student-centered learning approaches. We must get off our podiums, turn off the teacher-centered PowerPoint presentations, and turn the reigns of learning ... over to our students so that they can construct their own knowledge, meanings and solutions. We must empower learners, place them in charge of their own learning... (p. 47)

This profound shift has indeed not occurred at Glen Manor College. Teachers are still teaching at their podiums, and using the vast technology they have in uncreative, autocratic, traditional, and uninspiring ways. What has been a catalyst to cause this reform in Pleasant Dale Collegiate? Technology does not change the curriculum and pedagogy of WiredIMAGE. What creates change and contributes to WiredIMAGE's success are the particular circumstances of the school. These include the acceptance of teachers and students to work within the new program's structure, a focus on and embracement of a learner centered approach, developing student problem

solving, creative and critical thinking skills, and the employment of co-learning, collaboration and teacher-student partnerships. Furthermore, these partnerships are strengthened by the acceptance of a new power sharing between students and teachers. It is this alternative power-knowledge dynamic that both administrators and teachers have embraced in developing an outstanding digital art education program in the face of distressing and demoralizing cutbacks to public education. The Pleasant Dale example is certainly important as we enter fiscally uncertain and unstable times. Gregory (2009) advises that we must invent new student-centered approaches in art education virtual classrooms. WiredIMAGE administrators and educators have done this and have done it well. The WiredIMAGE Program is an example of a Visual Art educational program in which necessity is indeed the mother of invention. Thus, necessity has propelled teachers and administrators to implement significant positive change.

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Footnotes

¹*Luddite* is used to describe a person who is a novice working with new digital technologies.

²The old terminologies concerning Visual Arts no longer apply as art forms have merged into one another (Bell, Loader, Pleace, & Schuler; 2004). In our digital era, convergence of digital image, text, and sound is unavoidable and as Sturken and Cartwright (2002) reflect, these areas can no longer be isolated (p.345).

³ In the local city newspaper issued two years ago, Glen Manor College was identified as one of the Top 50 employers in that city. One of the reasons for this is its Information, Communication Technology (ICT) Program in which each teacher received a complementary computer, software, and tuition subsidies for courses taken.

⁴Prosumers is the term used to describe the youth of today who are involved in Web 2.0 technologies, and thus are active users of technology, co-innovating products, and services and creative shapers of digital bits in their everyday lives (Tapscott, 2009).

⁵ Tapscott (2009) defines "The Net Generation" as people between ages 16-29.